

Fieldwork

Offshore Mapping Captures Tar Seeps in the Santa Barbara Channel, California

By Pete Dartnell, Thomas Lorenson, and Brian Edwards

U.S. Geological Survey (USGS) scientists completed a 20-day mapping and ground-truthing cruise on the mainland shelf of the Santa Barbara Channel, California, revealing rock outcrops, possible sediment-transport pathways, and recent tar seeps. The fieldwork was part of a multiyear, multidisciplinary mapping project that the USGS is conducting in cooperation with the Department of the Interior's Minerals Management Service (MMS); California State University, Monterey Bay (CSUMB); the University of California, Santa Barbara (UCSB); and local agencies. The mapping supports numerous studies in the region, including investigations of offshore oil and gas seeps, coastal sediment transport, and benthic habitats.

Over the past 3 years, scientists from the USGS Western Coastal and Marine Geology team (WCMG) and CSUMB scientists have mapped the mainland shelf from the coast to the 3-mi State limit, from Naples southeastward to Point Mugu (more than 100 km of coastline), using interferometric and multibeam sonars. This past June and July, WCMG collected bathymetry (depth to the sea floor) and acoustic backscatter (strength of sound returned from the sea floor) in two areas, using a 117-kHz interferometric sonar. Simultaneous with the interferometric mapping, a 434-kHz chirp seismic profiler was used to locate gas bubbles in the water column in order to map the distribution of natural-gas seeps. A camera sled with one forward-looking video camera, a vertical video camera, and a vertical high-definition video camera was used to ground-truth the mapped regions, as well as to ground-truth multibeam data collected in 2006 offshore of Ventura and Oxnard by CSUMB.

U.S. Department of the Interior
U.S. Geological Survey



Research vessel Zephyr, used by USGS scientists for recent work in the Santa Barbara Channel. During mapping, an interferometric sonar sits about 2 m below the water surface, attached to the pole to the right of the word "Survey."



Diane Minasian on watch as a marine-mammal observer. If marine mammals approach within a certain distance of the vessel, acoustic equipment must be shut down to prevent adverse effects on the animals. Only one such shutdown, lasting half an hour, was necessary during last summer's cruise in the Santa Barbara Channel.

This summer's mapping consisted of three legs. During the first leg, **David Finlayson, Mike Boyle, Larry Kooker, Thomas Reiss, Peter Triezenberg, and Pete Dartnell** collected bathymetric data, acoustic-backscatter data, and seismic-reflection profiles offshore of Gaviota State Park. During the second leg, **Jamie**

Conrad, David Finlayson, Mike Boyle, Larry Kooker, Thomas Reiss, and Diane Minasian collected the same types of data offshore of Naples, adjacent to an area surveyed by the USGS in 2006 off Coal Oil Point (see "Mapping the Sea Floor Off Santa Barbara, California," *Sound Waves*, September 2006, URL <http://soundwaves.usgs.gov/2006/09/fieldwork2.html>). The third leg was used to collect seabed video

(Santa Barbara Channel continued on page 2)

Sound Waves

Editor

Helen Gibbons
Menlo Park, California
Telephone: (650) 329-5042
E-mail: hgibbons@usgs.gov
Fax: (650) 329-5190

Print Layout Editors

Susan Mayfield, Sara Boore
Menlo Park, California
Telephone: (650) 329-5066
E-mail: smayfiel@usgs.gov; sboore@yahoo.com
Fax: (650) 329-5051

Web Layout Editor

Jolene Shirley
St. Petersburg, Florida
Telephone: (727) 803-8747 Ext. 3038
E-mail: jshirley@usgs.gov
Fax: (727) 803-2032

SOUND WAVES (WITH ADDITIONAL LINKS) IS
AVAILABLE ONLINE AT URL
<http://soundwaves.usgs.gov/>

Contents

Fieldwork	1
Outreach	5
Meetings	7
Awards	10
Staff and Center News	11
Publications	12

Submission Guidelines

Deadline: The deadline for news items and publication lists for the November issue of *Sound Waves* is Wednesday, September 12.
Publications: When new publications or products are released, please notify the editor with a full reference and a bulleted summary or description.
Images: Please submit all images at publication size (column, 2-column, or page width). Resolution of 200 to 300 dpi (dots per inch) is best. Adobe Illustrator® files or EPS files work well with vector files (such as graphs or diagrams). TIFF and JPEG files work well with raster files (photographs or rasterized vector files).

Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

U.S. Geological Survey Earth Science Information Sources:

Need to find natural-science data or information? Visit the USGS Frequently Asked Questions (FAQ's) at URL <http://www.usgs.gov/search/faq.html>

Can't find the answer to your question on the Web? Call 1-888-ASK-USGS

Want to e-mail your question to the USGS? Send it to this address: ask@usgs.gov

Fieldwork, continued

(Santa Barbara Channel continued from page 1)



California, showing place-names mentioned in text.

Elaine Helix (MMS), and **Ira Leifer** (UCSB), who hosted a team of correspondents from the *Houston Chronicle* writing about natural oil seepage in the Santa Barbara Channel. The reporters joined the USGS team aboard the research vessel *Zephyr* for a day of real-time operations, photography, videography, and interviews. The reporters spent additional days with **Tom Lorenson**, visiting onland oil and tar seeps similar to those mapped in the marine study area, and with **Ira**

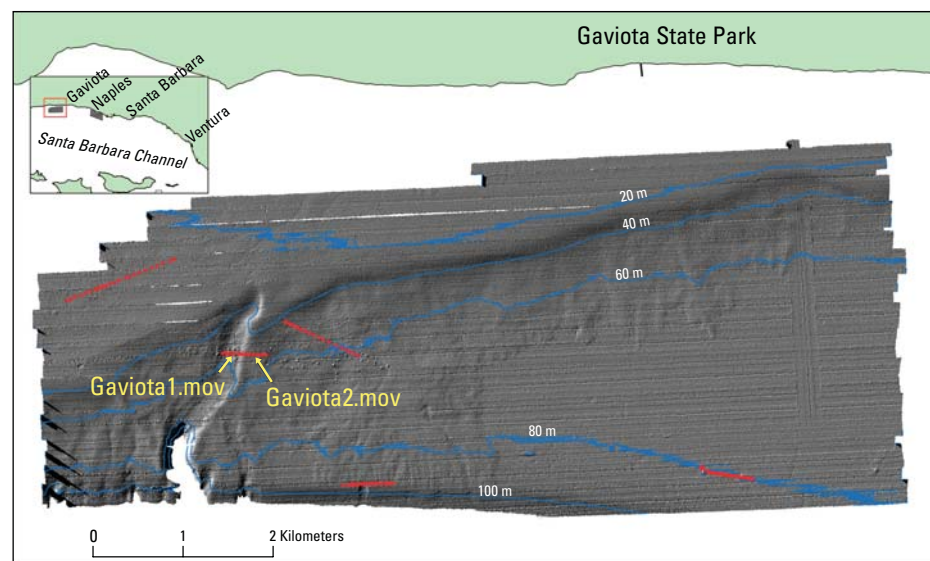
Leifer, tracking the genesis of tar from oil seep to tarball deposition on local beaches. The finished article and video should be available on the *Houston Chronicle* Web site (URL <http://www.chron.com/>) in September 2007.

footage to ground-truth the data collected offshore of Gaviota and Naples, as well as the multibeam data collected by CSUMB in 2006; participants in this leg included **Brian Edwards**, **Eleyne Phillips**, **Gerry Hatcher**, **Merit McCrea** (UCSB), and **Pete Dartnell**.

The participants in leg 2 were joined by **Tom Lorenson** (WCMG), **Mary**

The bathymetric data collected offshore of Gaviota State Park show a narrow inner shelf (0- to 30-m water depth) with linear depressions perpendicular to the shoreline. Approximately parallel to the coastline, the shelf steepens abruptly along the 30-m isobath. Lobes of sediment extend as flows from the base of this feature onto

Santa Barbara Channel continued on page 3)



Shaded-relief bathymetry offshore of Gaviota State Park in the northwestern Santa Barbara Channel, California. Red-dotted lines show video tracks during camera-sled ground-truthing operations. Labels "Gaviota1.mov" and "Gaviota2.mov" show approximate locations of tar-seep video clips posted at URL <http://soundwaves.usgs.gov/2007/09/>.

Fieldwork, continued

(Santa Barbara Channel continued from page 2)



Frame grabs of sea-floor video showing recent tar seeps offshore of Gaviota State Park, Santa Barbara Channel, California. See map of bathymetry offshore of Gaviota State Park for approximate locations of video clips; see text for discussion. Image at left is from 48-m water depth; image at right is from 40-m water depth. Beams of green laser light are 16 cm apart. To view video clips, visit URL <http://soundwaves.usgs.gov/2007/09/>.

the adjacent outer shelf. A 2.3-km-long linear arrangement of 2- to 3-m-high mounds was mapped crossing a 300-m-wide gully. Seabed video collected in this area shows evidence of recent tar seeps. For example, video clip “Gaviota1.mov,” captured at 48-m water depth, shows a hemispherical mound pushing up the surrounding sediment; the absence of sediment on its top indicates that the mound is relatively young. The second video clip, “Gaviota2.mov,” captured at 40-m water depth, also shows what appears to be a recent tar seep, with a shiny surface and no sediment cover. Unlike the mound in the first video clip, the tar appears to be flowing over the seabed sediment. Seabed oil and gas seeps are known to be common in the area, but this is the first time the USGS has obtained images with a towed video camera. The map of bathymetry offshore of Gaviota State Park shows the locations of these video clips, which can be viewed at URL <http://soundwaves.usgs.gov/2007/09/>.

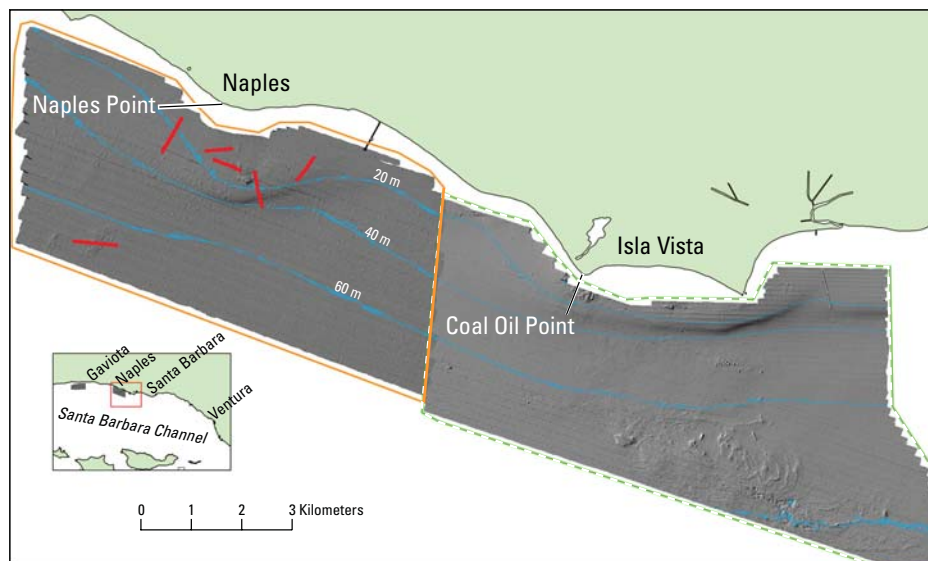
The bathymetric data collected offshore of the Naples area show a relatively uniform sediment-covered shelf. Video footage from an area of rougher sea floor in the southwest corner of the 2007 survey area revealed that the seabed here is sediment covered and

exhibits both small recent tar seeps and older seeps dusted with sediment. Also, about 1.5 km south-southeast of Naples Point is an area of 3- to 6-m-high outcrops that the video reveals to be differentially eroded bedrock with high concentrations of rockfish, starfish, and purple sea urchins.

Related *Sound Waves* articles and a USGS Open-File Report on mapping

within the Santa Barbara Channel are posted at:

- <http://soundwaves.usgs.gov/2006/09/fieldwork2.html>
- <http://soundwaves.usgs.gov/2005/10/fieldwork2.html>
- <http://soundwaves.usgs.gov/2004/11/fieldwork3.html>
- <http://pubs.usgs.gov/of/2005/1153/>



Shaded-relief bathymetry offshore of Naples and Coal Oil Point in the northwestern Santa Barbara Channel, California. USGS scientists mapped area outlined in dashed green in 2006 and area outlined in orange in 2007. Red lines show video tracks during camera-sled ground-truthing operations in 2007.

California Sea Otters—2007 Survey Count Reaches New High

By Gloria Maender

Observers led by scientists from the U.S. Geological Survey (USGS) counted a total of 3,026 California sea otters during the 2007 spring survey, marking a record high and a 12.4-percent increase over the 2006 count of 2,692. The previous high was 2,825 sea otters in spring 2004.

“The favorable viewing conditions—the best we’ve had in years during our spring surveys—likely contributed to the encouraging count,” said survey organizer **Brian Hatfield**, a USGS biologist stationed in San Simeon, California.

Also rising slightly is the latest 3-year running average—the average of the totals from the spring counts of 2005, 2006, and 2007—which is up 2.4 percent over the previous average, to 2,818 sea otters. To assess overall population trends, 3-year running averages of spring counts are used to reduce the influence of anomalously high or low

counts during any particular year, as recommended by the U.S. Fish and Wildlife Service (USFWS) ’s Southern Sea Otter Recovery Plan.

“We are guardedly optimistic about the slight increase in this latest 3-year running average,” said **Lilian Carswell** of USFWS, “although the population remains a considerable distance from the delisting threshold. For southern sea

otters to be considered for delisting, the 3-year running averages would have to exceed 3,090 for 3 continuous years.”

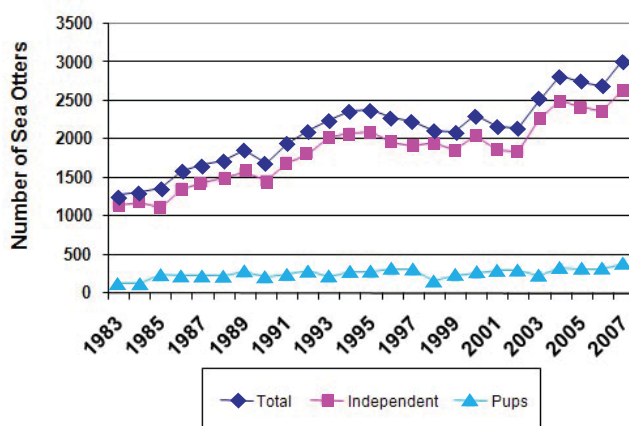
“While a high count is always better news than a low count, these counts have varied quite a lot in recent years,”

(Sea Otter Survey continued on page 5)



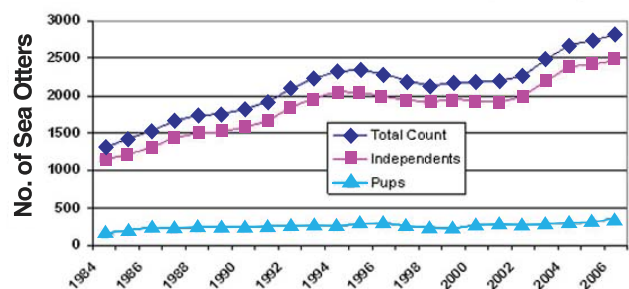
The spring 2007 California sea-otter survey covered about 375 mi of the California coast, from Point San Pedro in the north to Rincon Point in the south.

Spring Counts of Southern Sea Otters
1983-2007



Number of southern sea otters counted during spring surveys.

Sea Otter Counts: 3-Year Running Averages



Number of southern sea otters counted during spring surveys, plotted as 3-year running averages. (For example, values for 2006 are averages of the 2005, 2006, and 2007 counts.)

Fieldwork, continued

(Sea Otter Survey continued from page 4)

said USGS scientist **Jim Estes**, whose sea-otter expertise spans more than 3 decades. He pointed out that last year's count was on the low side, for example, and noted that "We cannot infer much about the population until there has been a sustained trend."

Several segments of the coast surveyed this spring showed significant increases in the adult and subadult group of sea otters called independents. The greatest increase was 135 more independents this year for Monterey Bay. At the south end of the survey area, 39 independents were spotted

east of Gaviota and 29 in the Naples Reef area, approximately 7 km west of Coal Oil Point (50 km east of Point Conception). By comparison, none were spotted east of Gaviota during the spring 2005 count, and only one in spring 2006.

The spring 2007 California sea-otter survey was conducted May 2-17 and covered about 375 mi of California coast, from Point San Pedro in the north to Rincon Point in the south. Overall viewing conditions were more favorable than those during the spring 2006 survey. The annual spring

survey is a cooperative effort of the USGS, the California Department of Fish and Game's Marine Wildlife Veterinary Care and Research Center, the Monterey Bay Aquarium, and many experienced and dedicated volunteers. The information gathered from spring surveys is used by Federal and State wildlife agencies in making management decisions about this small sea mammal.

For additional information about the 2007 California sea-otter survey, visit URL <http://www.werc.usgs.gov/otters/ca-surveyspr2007.htm>. ☼

Outreach

Upcoming!

"A Tale of Two Kelp Forests"—USGS Will Observe Sea Otter Awareness Week with a Public Lecture on September 27 in Menlo Park, California

Schools, museums, aquariums, zoos, and other organizations along the west coast will celebrate Sea Otter Awareness Week from September 23 to 29, 2007. This weeklong event is designed to educate the public about the integral role that sea otters play in the nearshore marine ecosystem, as well as the importance of biological diversity. As part of the celebration, the U.S. Geological Survey (USGS) office in Menlo Park, California, will offer a public lecture on sea otters on the evening of Thursday, September 27. **Tim Tinker**, a research biologist at the University of California, Santa Cruz, and a collaborator with USGS sea-otter expert **Jim Estes**, will present "A Tale of Two Kelp Forests: Sea Otters and Ecosystem Dynamics in the Aleutians and the Commander Islands." For 15 years **Tinker** has been studying sea-otter populations in Alaska, California, and, most recently, the Russian Commander Islands. His lecture will explore reasons why sea-otter populations in the central and western Aleutian Islands have declined



Sea otter in kelp bed. Photograph by **Chris Brown**, USGS.

by 75 to 95 percent over the past 15 to 20 years, while populations in the nearby Russian Commander Islands—which are physically and biologically quite similar to the Aleutians—have remained nearly stable. For information

about the USGS Monthly Public Lecture series in Menlo Park, visit URL <http://online.wr.usgs.gov/calendar/>; to learn more about Sea Otter Awareness Week, visit URL <http://www.defenders.org/seaotter/awareness/>. ☼

MIT Summer Research Program Students Tour USGS Woods Hole Science Center

By Claudia H. Flores

The U.S. Geological Survey (USGS)'s Woods Hole Science Center in Woods Hole, Massachusetts, participated in a science-community tour for students in the Massachusetts Institute of Technology (MIT)'s Summer Research Program (MSRP) on Saturday, July 7, 2007. The MSRP program provides an opportunity for talented undergraduate students from underprivileged backgrounds, first-generation college students, and underrepresented minorities in science and engineering fields to acquire research experience in their field of interest at MIT.

During their 1-day visit to Woods Hole, the MSRP students received morning tours of the Woods Hole Science Aquarium (part of the National Oceanic and Atmospheric Administration's Northeast Fisheries Science Center) and the Woods Hole Oceanographic Institution's Redfield and Smith Laboratories. In the afternoon, the students split into groups to visit one of the following: the Sea Education Association (SEA) campus, the Woods Hole Research Center campus, and the USGS Woods Hole Science Center. To wrap up their day, the students heard representatives of the respective institutions describe research opportunities, summer programs, and graduate programs available in the Woods Hole science community.

Those students who visited the USGS Woods Hole Science Center received



MSRP students receive an introduction at the USGS Woods Hole Science Center before viewing the GeoWall data-visualization system. Photograph by Chris Polloni.

a tour of the GHASTLI (Gas Hydrate and Sediment Testing Laboratory Instrument) from **Bill Winters**, who also gave them a short presentation on gas hydrates. **Claudia H. Flores** used the center's GeoWall data-visualization system to illustrate various research projects conducted by the USGS Coastal and Marine Program and to show how the GeoWall is useful in visualizing spatial problems. **Flores'** presentation emphasized the diversity of academic fields represented by USGS scientists, who conduct research on such wide-ranging topics as sea-floor

mapping, benthic-habitat studies, investigation of environmental problems, geophysical surveys of sub-sea-floor sediment, studies of tsunami hazards, and much more. **Chris Polloni** provided a more thorough explanation of the software and hardware that make the GeoWall data-visualization system possible.

Although their visit was brief, the students were excited to learn about the research being done here at Woods Hole, asked thoughtful questions, and enjoyed exploring what Woods Hole has to offer. This was a valuable outreach opportunity to lure young scientific minds into the possibilities of coastal and marine research.

Participants representing the USGS were **Claudia H. Flores**, **Bill Winters**, and **Chris Polloni**. Organizers of the visit were **Christopher Jones** of the MIT Graduate Students Office, **Julia Westwater** of the WHOI Academic Programs Office, and **Regina Campbell-Malone** of the MIT/WHOI Joint Program.

For more information about the MIT Summer Research Program, visit URL <http://web.mit.edu/gso/admissions/summer.html>. For more information about the Woods Hole Diversity Advisory Committee, visit at URL <http://www.woodsholediversity.org/>. ☼

Coastal-Hazards Research Featured in First Podcast by USGS

Each year, hurricanes and tropical storms cause billions of dollars worth of damage in the Southeastern United States. These destructive coastal storms typically peak in August and September, making August an ideal time for the U.S. Geo-

logical Survey (USGS) to release its first podcast, titled "Hurricanes and Extreme Storms—Coastal Hazards, Assessments, and Changes."

This episode is the first public USGS podcast—called a CoreCast—to be posted

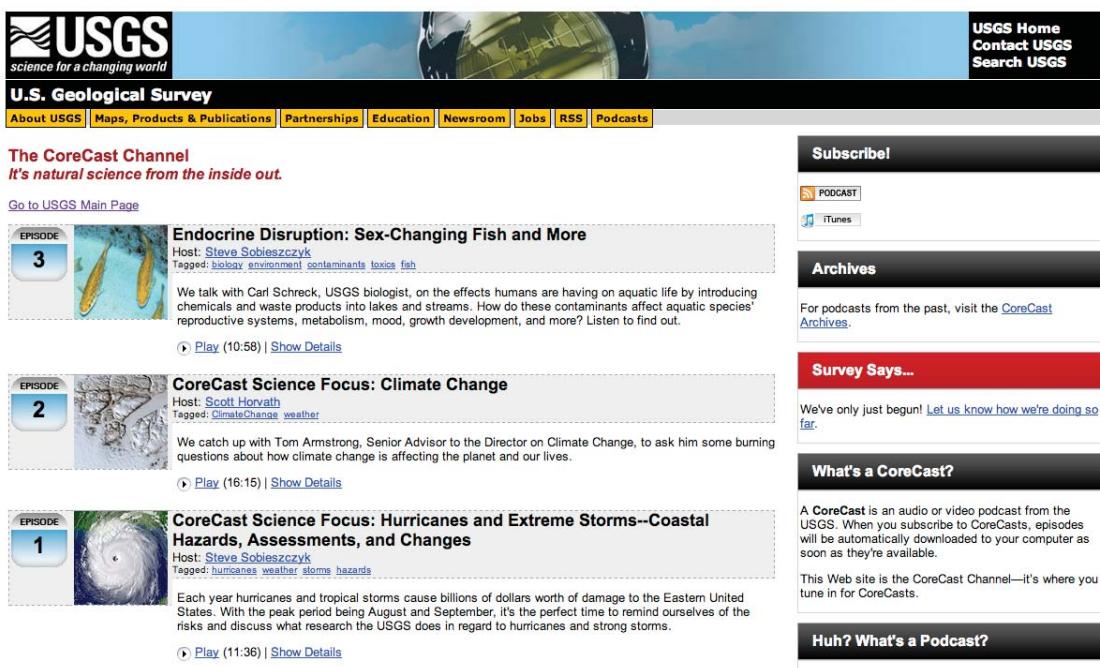
at URL <http://www.usgs.gov/corecast/>. "Hurricanes and Extreme Storms" features an interview with USGS oceanographer **Abby Sallenger** of the USGS Florida Integrated Science Center (FISC)

(USGS Podcast continued on page 7)

Outreach, continued

(USGS Podcast continued from page 6)

office in St. Petersburg, Florida. Host **Steven Sobieszczyk**, a geographer with the USGS Oregon Water Science Center in Portland, Oregon, begins the CoreCast with a brief explanation of hurricanes and then interviews **Sal-lenger** on hurricane impacts and how the USGS contributes to hurricane research and response. **Sallenger** describes how the USGS monitors and measures the impacts of hurricanes, and outlines some of the ways in which the USGS assisted emergency response in the aftermath of Hurricane Katrina—the most destructive storm in U.S. history. He discusses the degree to which natural features, such as barrier islands and wetlands, can help protect the mainland from hurricane storm surge and waves, noting some unexpected results from recent research.



Learn more from the CoreCast itself at URL <http://www.usgs.gov/corecast/>, where two more CoreCasts, “Climate Change” and “Endocrine Disruption: Sex-Changing Fish and More,” have also been posted; check back or subscribe to receive additional podcasts. 🌀

Excerpt from USGS CoreCast Web page at URL <http://www.usgs.gov/corecast/> as of August 30, 2007. Check the page periodically for new podcasts.

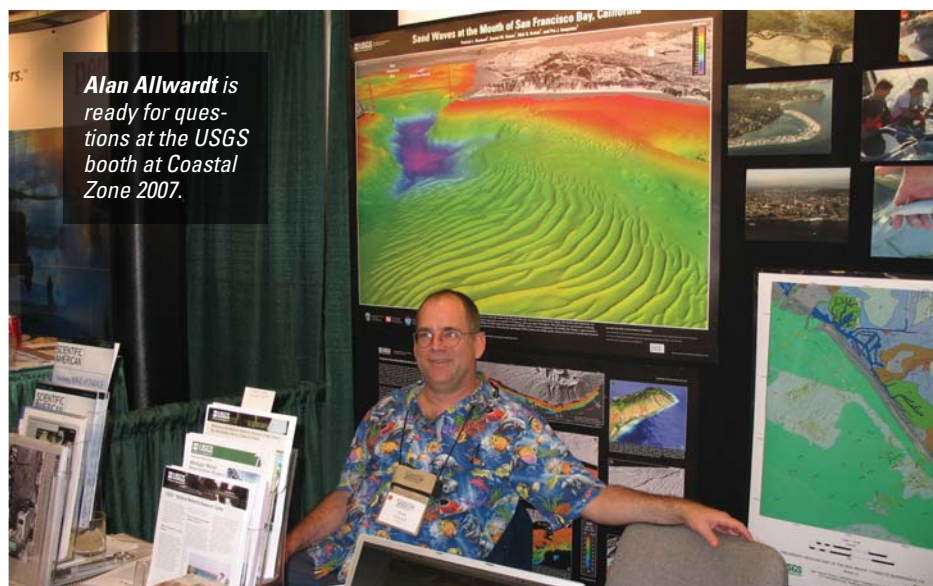
Meetings

Scientists Meet Managers at Coastal Zone 2007

By Helen Gibbons and Alan Allwardt

Several U.S. Geological Survey (USGS) scientists were among the more than 800 attendees at Coastal Zone 2007, a biennial conference held this year in Portland, Oregon, from July 22 to 26. The meeting, billed as the largest international gathering of ocean- and coastal-management professionals in the world, was organized by the National Oceanic and Atmospheric Administration (NOAA) and drew representatives from Federal, State, and local governments; academia; nonprofit organizations; and private industry to share their knowledge of issues affecting the world’s coasts and oceans and to discuss strategies for addressing those issues.

(Coastal Zone 2007 continued on page 8)



Alan Allwardt is ready for questions at the USGS booth at Coastal Zone 2007.

Meetings, continued

(Coastal Zone 2007 continued from page 7)

Participants came from most of the 30 States that border the Pacific Ocean, the Atlantic Ocean, the Gulf of Mexico, and the Great Lakes. Other attendees came from Canada and from more distant locales, including Vietnam, Japan, Australia, South Africa, Nigeria, and nearly a dozen European countries.

Field trips and training sessions were offered on Sunday, July 22, and the conference formally opened on Monday, July 23. The Monday morning plenary session began with remarks by Vice Admiral **Conrad C. Lautenbacher, Jr.**, U.S. Navy (Ret.), the NOAA administrator, who introduced two keynote speakers with long and distinguished careers in public service: **Leon Panetta**, former congressman, White House chief of staff to **Bill Clinton**, and chair of the Pew Oceans Commission, who is now director of the Leon and Sylvia Panetta Institute for Public Policy and cochairman of the Joint Ocean Commission Initiative; and **William Ruckelshaus**, former head of the Environmental Protection Agency (EPA), acting director of the Federal Bureau of Investigation (FBI), Deputy Attorney General of the United States, and member of the U.S. Commission on Ocean Policy, who is



Laura Torresan holds an image of the floor of San Francisco Bay for a visitor viewing it with 3D glasses.

now strategic director of the Madrona Venture Group and chair of the Puget Sound Leadership Council. **Panetta** spoke of the need for a coordinated national ocean policy and urged U.S. accession to the United Nations (U.N.) Convention on the Law of the Sea. **Ruckelshaus** discussed the ongoing effort of the Puget Sound Partnership to develop the 2020 Action Agenda, a long-term plan to restore and manage the complex ecosystems of Puget Sound and the surrounding watersheds.

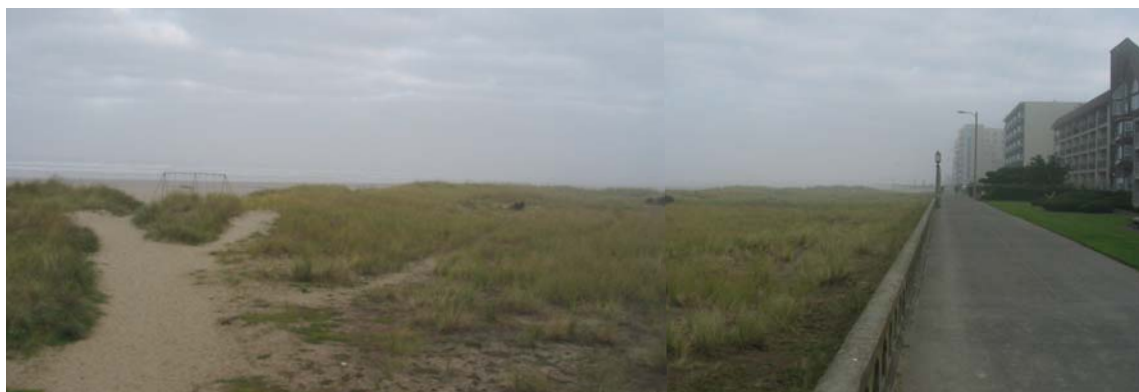
From Monday through Thursday, participants presented short talks in concurrent

sessions on such widely varying topics as fisheries management, renewable energy from the ocean, tsunami-inundation modeling, beach erosion, and more. Talks by scientists currently or recently with the USGS included “GIS Data for the Seaside, Oregon, Tsunami Pilot Study to Modernize FEMA Flood Hazard Maps” (**Florence Wong**), “The Hawaii Tsunami Risk Assessment Project” (**Nathan Wood**), “Pharmaceuticals and Personal Care Products Detected in Streambed Sediments of the Lower Columbia River and Selected Tribu-

taries” (**Elena Nilsen**), “Assessing Shoreline Change Trends Along U.S. Pacific Northwest Beaches” (**Peter Ruggiero**, now with Oregon State University), “Variations in Community Vulnerability to Tsunamis in the Pacific Northwest” (**Wood**), and “The Relationship of Imperviousness and Landslides in Seattle, Washington” (**George Xian**).

During a 2-hour poster session on Tuesday evening, the USGS was represented by **Jane Reid** (“Integration of Seafloor Point Data in usSEABED”), **Alan Allwardt** (“The Coastal Change Hazards Node of the USGS Coastal and Marine Knowledge Bank”), and retiree

During Coastal Zone 2007's North Coast Beaches Field Trip, USGS scientist **Florence Wong** saw firsthand the vulnerability of Seaside, Oregon, to tsunami hazards. Little elevation difference exists between resort developments and the adjacent shoreline (shown here in a composite of photographs by USGS scientist **Bruce Jaffe**). At the meeting, **Wong** presented geographic-information-system (GIS) data for the Seaside area that are part of an effort to improve tsunami-hazard information in Federal Emergency Management Agency (FEMA) flood-hazard maps. (See recent publication by **Wong** and others, USGS Data Series 236, at URL <http://pubs.usgs.gov/ds/2006/236/>)



(Coastal Zone 2007 continued on page 9)

(Coastal Zone 2007 continued from page 8)

John Dingler (“Reestablishing a Wetland in Tomales Bay, California, from Diked Farm Land”).

Additional opportunities to meet and share ideas were provided by social gatherings centered around light meals. Several of these gatherings took place in the Exhibit Hall, where attendees could browse 30 booths presented by Federal, State, local, and private organizations. **Helen Gibbons** and **Laura Torresan** set up and staffed a USGS booth, with relief

provided by **Alan Allwardt**, **Jane Reid**, and **Sam Johnson**. They fielded questions from visitors and gave away fact sheets and other handouts from the Coastal and Marine Geology Program and the Terrestrial, Freshwater, and Marine Ecosystems Program, the two USGS programs that provided funding for Coastal Zone 2007.

Many USGS personnel who could not attend the meeting provided handout materials and contributed as coauthors of talks and poster presentations. To view abstracts

and a detailed program, visit URL <http://www.csc.noaa.gov/cz/> and click on “CZ 07 Proceedings.”

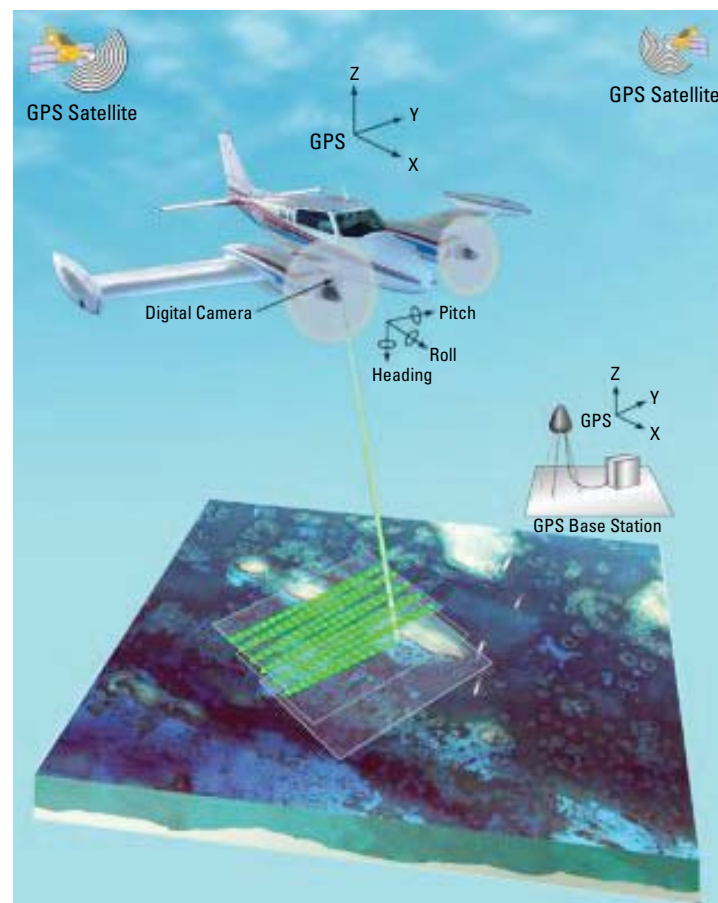
With its emphasis on management issues, Coastal Zone 2007 was a somewhat unusual conference for USGS scientists, but it provided excellent opportunities to discover what types of USGS information are valued by coastal managers. Mark your calendars and consider attending the next Coastal Zone conference, to be held in Boston, Massachusetts, in 2009. ☼

USGS Hosts Airborne-Lidar Technology and Applications Workshop in Louisiana

By Emily Klipp and Amar Nayegandhi

The U.S. Geological Survey (USGS) hosted a workshop on airborne lidar (light detection and ranging) on June 20-21, 2007, in Baton Rouge, Louisiana. The workshop was held in the state-of-the-art auditorium at the Louisiana Transportation Research Center on the Louisiana State University campus. The primary objective was to educate attendees on airborne-lidar technology and its potential applications in the northern Gulf of Mexico region. The workshop also provided an opportunity to discuss possible collaborations in the acquisition and application of lidar data, with a focus on investigations of the geomorphologic structure, ecologic function, and hazard vulnerability of the northern gulf coast. The workshop was attended by 60 participants from several Federal, State, local, and private agencies, including representatives from the USGS, the Louisiana Department of Natural Resources (LA-DNR), the Louisiana Coastal Restoration Division (part of LA-DNR), the National Park Service, the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the University of New Orleans, and the U.S. Army Corps of Engineers (USACE).

Amar Nayegandhi, an ETI contractor at the USGS Florida Integrated Science Center (FISC), organized the workshop. The steering committee included **John**



Airborne lidar technology as used by the Experimental Advanced Airborne Research Lidar (EAARL) system (URL <http://inst.wff.nasa.gov/eaarl/>), includes a water-penetrating, green-wavelength lidar; dual-phase kinematic GPS receivers on the aircraft and the ground, with differential correction for better positioning accuracy; an inertial measurement unit (IMU) for determining aircraft attitude (pitch, roll, and heading); and a digital camera that acquires a high-resolution color-infrared photograph every second.

Brock, FISC; **Charles Demas**, USGS Louisiana Water Science Center; **Dawn Lavoie**, USGS Gulf of Mexico Science Coordinator; **Pat O’Neil**, USGS Geospatial Liaison for Louisiana; and **Emily Klipp**, ETI contractor at FISC.

The first day of the workshop focused on plenary presentations by experienced lidar users from various Federal agencies. After brief introductions from **Demas** and **O’Neil**, **Nayegandhi** gave an overview

(Lidar Workshop continued on page 10)

Meetings, continued

(Lidar Workshop continued from page 9)

of airborne-lidar technology, focusing on the capabilities and limitations of existing lidar technology. **Nayegandhi** also highlighted the importance of Global Positioning System (GPS) and accurate aircraft-attitude (pitch, roll, and heading) measurements for accuracy. **Brock** gave an overview of airborne-lidar applications, with emphasis on cross-environment lidar surveying (simultaneous mapping of land and submerged topography) and coral-reef applications. **Darrin Lee** (LA-DNR), **Dean Gesch** (USGS), **Hilary Stockdon** (USGS), and **Chris Parrish** (NOAA) each described their use of lidar in coastal research; applications of lidar technology in coastal restoration, storm-surge modeling, coastal change, and shoreline delineation were presented to a captivated audience. **Eddie Wiggins** (USACE) and **C. Wayne Wright** (NASA) described state-of-the-art lidar sensors (CHARTS [URL <http://shoals.sam.usace.army.mil/>] and EAARL [URL <http://inst.wff.nasa.gov/eaarl/>], respectively) capable of mapping sub-aerial and submarine topography using a water-penetrating, green-wavelength lidar. **Robert Kayen** (USGS) introduced the audience to a ground-based lidar system capable of providing resolution and accuracy an order of magnitude better than airborne lidar systems, the obvious limitation being smaller spatial coverage. **Jason Stoker** (SAIC contractor at USGS) concluded the presentations by offering insights on data

sharing and management and by summarizing a report of the first National Lidar Initiative meeting, hosted by the USGS in Reston, Virginia, in February 2007 (URL <http://lidar.cr.usgs.gov/presentations/NLImeetingReport.pdf>).

The second day began with **Lavoie** heading a brief discussion on the exploration of potential partnerships for integrated-science studies in the northern Gulf of Mexico. The discussion was followed by breakout sessions that addressed three topics: (1) hydrologic applications, (2) wetlands-ecology and upland-vegetation applications, and (3) coastal hazards and storm impacts. Each group was asked to begin its discussion session by answering four questions:

- What are the specific data needs?
- What is the current status of lidar-data acquisition and processing?
- Is the accuracy of currently available data sufficient?
- What are your specific areas of interest and locations for potential lidar-data acquisition?

After nearly 2 hours of discussion, the groups reconvened and shared their results. **Demas**, representative for the group discussing hydrologic applications, noted a need for (1) better than the 2-ft (60 cm) accuracy of topographic data available for most major basins in Louisiana, (2) an organized group of lidar experts to determine appropriate topographic-product

specifications for different habitats and the best time to conduct a lidar survey, and (3) standardizing methods and finding the best accuracy with given resources. **Dan Kroes** (USGS), representative for the group discussing wetlands-ecology and upland-vegetation applications, noted a need for (1) surveying appropriately according to the type of habitat, for example, more frequent surveys for a habitat that changes often, such as wetlands, and less frequent surveys for those that change less often, such as upland forests; and (2) better integration of hyperspectral data (a measure of reflected sunlight over an extremely wide portion of the light spectrum) with existing lidar data (which uses an active light source to determine the range to the target). **Gesch**, representative for the group discussing coastal hazards and storm impacts, noted a need for (1) more frequent surveys of barrier islands and continued monitoring of storm-affected habitats; and (2) better quality of data at the land/water interface, possibly attained by using a green-wavelength lidar with a short laser pulse (such as EAARL).

The general consensus of all the groups was the great potential of using ground-based lidar to help interpret and, possibly, improve the accuracy of airborne-lidar topographic data. It was hoped that the many contacts made by participants would lead to cooperation on a myriad of projects with a better understanding of lidar technology. ☼

Awards

USGS Hydrologist Honored for Outstanding Community Outreach

By Diane Noserale



On June 14, **Ann Tihansky** received the Outstanding Community Outreach award during the 2007 U.S. Geological Survey (USGS) Communications Conference in Baltimore, Maryland. A hydrologist who leads the science-communications efforts at the Florida Integrated Science Center office in St. Petersburg, Florida, **Tihansky** was honored for her success in connect-

Ann Tihansky in her USGS office in St. Petersburg, Florida.

ing research organizations, educators, and the local community. Her efforts have helped to educate students, to promote interest in Florida's unique coastal and water-resource issues, and to increase the USGS's visibility throughout Florida. She has worked with the University of South Florida-St. Petersburg's journalism department to offer a summer journalism-intern program, and works regularly with the university's College of Marine Science

(Ann Tihansky continued on page 11)

Awards, continued

(Ann Tihansky continued from page 10)

and other research organizations in St. Petersburg. She also participates in and promotes a community forum that holds monthly brownbag-lunch discussions to link local news outlets and scientists. She has helped to lead the USGS partnership

with the American Ground Water Trust, providing USGS science to teachers, and has worked with the Pier Aquarium in St. Petersburg to design exhibits highlighting USGS hurricane research and to turn fifth-graders into "Watershed Watchers."

Tihansky has given presentations at the National Marine Educators Association conference, and she coordinates an annual, multiday USGS open house for the public, including a special day for local schools that draws about 800 students. ❁

Staff and Center News

Upcoming! New Vice President of Pacific Section SEPM Helps Plan Fall Field Trips

The Pacific Section of the Society for Sedimentary Geology (SEPM) recently welcomed U.S. Geological Survey (USGS) scientist **Amy Draut** as its new Vice President. As part of her new duties, **Amy** is helping to organize two daylong field trips:

- "Geology and Stratigraphy of Stanford Linear Accelerator Center (SLAC), Menlo Park, California," to be led by **Kenn Ehman** (Chevron Energy Technology Company) and **Susan Witebsky** (SLAC) on Saturday, October 6, 2007, and

- "Paleogene Conglomeratic Submarine Canyon Fill, Point Lobos State Reserve," to be led by **Ed Clifton** (USGS Scientist Emeritus) and **Larry Rychner** (Chevron Production, retired) on Sunday, October 7, 2007.

The trips are open to both members and nonmembers of SEPM. To learn more, visit URL <http://www.sci.sdsu.edu/pacsepm/SEPMfieldtrips.htm>.

Amy is currently a research geologist with the USGS Western Coastal and Marine Geology team. She received a B.S. in geological sciences from Tufts University

in 1997 and a Ph.D. in geology and geophysics from the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in 2003. Her dissertation focused on fine-grained sedimentation on the northern Gulf of Mexico coast and shallow continental shelf. While in graduate school, **Amy** also developed a lasting interest in the evolution of volcanic arcs and arc-continent collisions, studying the tectonic, sedimentary, and geochemical evolution of arcs in the Ordovician Caledonide orogen of

(Amy Draut continued on page 12)



Participants in the October 7, 2007, Pacific Section SEPM field trip will visit the Carmelo Formation at Point Lobos State Reserve on the central California coast, a well-exposed example of conglomeratic submarine-canyon fill.



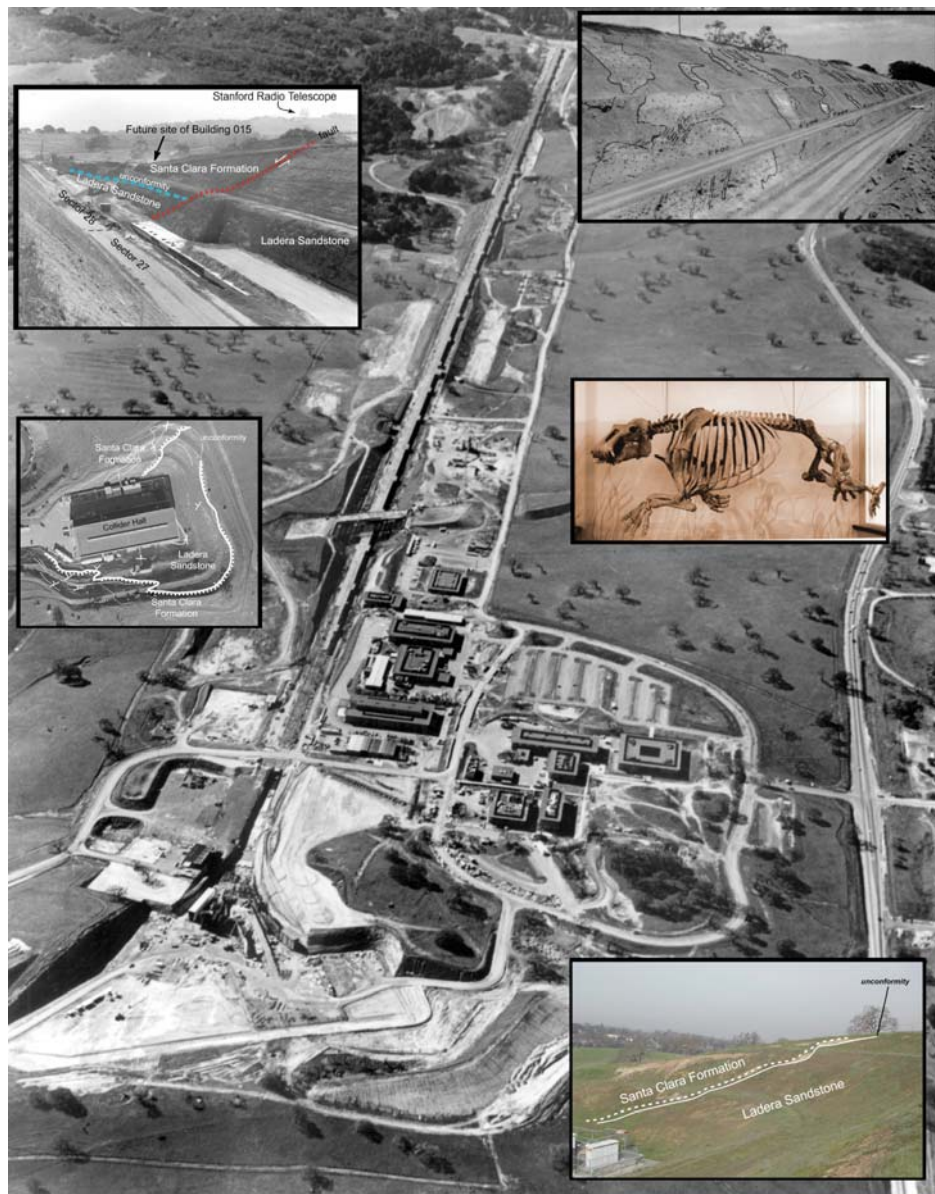
Amy Draut surveying on the Elwha River.

(Amy Draut continued from page 11)

western Ireland and the Jurassic Talkeetna Formation of Alaska.

After graduate school, **Amy** moved west to work as a postdoctoral researcher with USGS geologist **Dave Rubin** on sediment-transport investigations in the Grand Canyon; she became a permanent member of the Western Coastal and Marine Geology team in 2006. **Amy's** recent work for the USGS includes investigating the role of eolian sediment in the preservation of archeological sites along the Colorado River in the Grand Canyon, tracing fluvial sediment on the shallow shelf offshore of Santa Barbara, California, and on the north shore of Kaua'i, Hawai'i, and monitoring sediment grain size and channel topography of the lower Elwha River, Washington, in preparation for a major dam-removal project. She is currently tying together her interests in modern and ancient sedimentary processes by editing a Geological Society of America Special Paper on the sedimentary record in arc-collision zones. ❁

*Aerial view of Stanford Linear Accelerator (SLAC) campus, site of the October 6, 2007, Pacific Section SEPM field trip. Inset photograph at center right shows skeleton of the rare marine desmostylian mammal, *Paleoparadoxia*, discovered during excavation in 1964 (see URL <http://www2.slac.stanford.edu/VVC/paleo.html>).*



Publications

Recently Published Articles

- Ackleh, A.S., Allen, L.J.S., and Carter, J., 2007, Establishing a beachhead; a stochastic population model with an Allee effect applied to species invasion: Theoretical Population Biology, v. 71, no. 3, p. 290-300 [URL <http://www.sciencedirect.com/science/journal/00405809>].
- Allain, L., 2007, Coastal prairie restoration information system: version 1

- (Louisiana): U.S. Geological Survey Data Series 256 [URL <http://pubs.usgs.gov/ds/2007/256/>].
- Anderson, T.M., Metzger, K.L., and McNaughton, S.J., 2007, Multi-scale analysis of plant species richness in Serengeti grasslands: Journal of Biogeography, v. 34, no. 2, p. 313-323 [URL <http://www.blackwell-synergy.com/doi/abs/10.1111/j.1365-2699.2006.01598.x>].

- Baldwin, H.Q., Grace, J.B., Barrow, W.C., Jr., and Rohwer, F.C., 2007, Habitat relationships of birds overwintering in a managed coastal prairie: Wilson Journal of Ornithology, v. 119, no. 2, p. 189-197.

(Recently Published continued on page 13)

(Recently Published continued from page 12)

- Barnhardt, W.A., Denny, J.F., Baldwin, W.D., Schwab, W.C., Morton, R., Gayes, P.T., and Driscoll, N., 2007, Geologic framework of the Long Bay inner shelf; implications for coastal evolution in South Carolina: Coastal Sediments 2007, New Orleans, La., May 13-17, 2007, Proceedings, 13 p., CD-ROM.
- Barras, J.A., 2007, Satellite images and aerial photographs of the effects of Hurricanes Katrina and Rita on coastal Louisiana: U.S. Geological Survey Data Series 281 [URL <http://pubs.usgs.gov/ds/2007/281/>].
- Barrow, W.C., Jr., Fontenot, B., Barrow, M.H., DeMay, R., and Muth, D., 2006, Vanishing before our eyes; Louisiana cheniere woods and the birds that depend on them: Thibodaux, La., Barataria-Terrebonne National Estuary Program, 28 p. [URL http://birds.btnep.org/client_files/topic_files/Chenier16.pdf].
- Bothner, M.H., and Butman, B., eds., 2007, Processes influencing the transport and fate of contaminated sediments in the coastal ocean—Boston Harbor and Massachusetts Bay: U.S. Geological Survey Circular 1302, 89 p. [URL <http://pubs.usgs.gov/circ/2007/1302/>].
- Broussard, L., 2007, Welcome to the National Wetlands Research Center Library; not just another library—a special library: U.S. Geological Survey Fact Sheet 2007-3028 [URL <http://pubs.usgs.gov/fs/2007/3028/>].
- Broussard, L., 2007, Welcome to the National Wetlands Research Center Library; successful research begins @ your library: U.S. Geological Survey Fact Sheet 2007-3033 [URL <http://pubs.usgs.gov/fs/2007/3033/>].
- Butman, B., Dalyander, P.S., Bothner, M.H., and Lange, W.H., 2007, Time-series photographs of the sea floor in western Massachusetts Bay, version 1, 1989-1993: U.S. Geological Survey Data Series 265 [URL <http://woodshole.er.usgs.gov/pubs/ds-265/>].
- Chan, L.-H., and Hein, J.R., 2007, Lithium contents and isotopic compositions of ferromanganese deposits from the global ocean: Deep Sea Research II, v. 54, no. 11-13, p. 1147-1162 [URL <http://www.sciencedirect.com/science/journal/09670645>].
- Clark, C.M., Cleland, E.E., Collins, S.L., Fargione, J.E., Gough, L., Gross, K.L., Pennings, S.C., Suding, K.N., and Grace, J.B., 2007, Environmental and plant community determinants of species loss following nitrogen enrichment: Ecology Letters, v. 10, no. 7, p. 596-607 [URL <http://www.blackwell-synergy.com/doi/abs/10.1111/j.1461-0248.2007.01053.x>].
- Drake, D.L., Altig, R., Grace, J.B., and Walls, S.C., 2007, Occurrence of oral deformities in larval anurans: Copeia, v. 2007, no. 2, p. 449-458 [URL <http://apt.allenpress.com/perlserv/?request=get-toc&issn=0045-8511&volume=2007&issue=2>].
- Gibbons, Helen, and Barnard, P.L., 2007, Sand waves at the mouth of San Francisco Bay, California: U.S. Geological Survey General Information Product 54, postcard [URL <http://pubs.usgs.gov/gip/2007/54/>].
- Grossman, E.E., Stevens, Andrew, Gelfenbaum, Guy, and Curran, Christopher, 2007, Nearshore circulation and water column properties in the Skagit River Delta, northern Puget Sound, Washington—juvenile Chinook salmon habitat availability in the Swinomish Channel: U.S. Geological Survey Scientific Investigations Report 2007-5120, 96 p. [URL <http://pubs.usgs.gov/sir/2007/5120/>].
- Handley, L., Altsman, D., and DeMay, R., eds., 2007, Seagrass status and trends in the northern Gulf of Mexico; 1940–2002: U.S. Geological Survey Scientific Investigations Report 2006–5287, 267 p. [URL <http://pubs.usgs.gov/sir/2006/5287/>].
- Haydel, J., and Thibodeaux, C., 2007, Tired of searching endlessly for coastal wetlands resources? The U.S. Geological Survey's National Biological Information Infrastructure can help: Challenges of Natural Resource Economics and Policy, National Forum on Socioeconomic Research in Coastal Systems, 2nd, New Orleans, May 20-23, 2007, Conference Program/Abstracts, p. 27 [URL <http://www.cnrep.lsu.edu/2007/agenda.htm>].
- Hein, J.R., Zierenberg, R.A., Maynard, J.B., and Hannington, M.D., 2007, Barite-forming environments along a rifted continental margin, Southern California Borderland: Deep Sea Research II, v. 54, no. 11-13, p. 1327-1349 [URL <http://www.sciencedirect.com/science/journal/09670645>].
- Middleton, B.A., 2003, Temperate freshwater wetlands of Asia, the Pacific, Central and South America; climate change and other threats [abs.]: Environmental Future of Aquatic Ecosystems, International Conference on Environmental Future, 5th, Zurich, Switzerland, March 23-27, 2003, Abstracts, 1 p. [URL <http://www.icef.eawag.ch/abstracts/middleton.pdf>].
- Morton, R.A., Goff, J.R., and Nichol, S.L., 2007, Impacts of the 2004 Indian Ocean tsunami on the southwest coasts of Sri Lanka: Coastal Sediments 2007, New Orleans, May 13-17, 2007, Proceedings, v. 2, p. 1061-1074 [also on CD-ROM].
- Owens, A.B., Proffitt, C.E., and Grace, J.B., 2007, Prescribed fire and cutting as tools for reducing woody plant succession in a created salt marsh: Wetlands Ecology and Management, v.15, no. 5, p. 405-416 [URL <http://www.springerlink.com/content/103012/>].
- Pham, L., Boudreaux, S., Karhbet, S., Price, B., Ackleh, A.S., Carter, J., and Pal, N., 2007, Population estimates of *Hyla cinerea* (Schneider) (green tree frog) in an urban environment: Southeastern Naturalist, v. 6, no. 2, p. 203-216 [URL <http://www.bioone.org/perlserv/?request=get-toc&issn=1528-7092&volume=6&issue=2&ct=1>].
- Polgári, M., Hein, J.R., Tóth, M., Vigh, T., and Bíró, L., 2007, Did hydrothermal fluids contribute to the huge Úrkút manganese ore body?: Goldschmidt Conference, Cologne, Germany, August 19-24, 2007, abstracts volume, p. A801 [URL <http://www.goldschmidt2007.org/abstracts.php>].
- Poppe, L.J., Ackerman, S.D., Moser, M.S., Stewart, H.F., Foster, D.S., Blackwood, D.S., and Butman, B., 2007, Sedimentary environments and processes in the vicinity

(Recently Published continued on page 14)

(Recently Published continued from page 13)

- of Quicks Hole, Elizabeth Islands, Massachusetts [abs.]: *Eos* (American Geophysical Union Transactions), v. 88, no. 23, Joint Assembly supp., abstract OS23B-07 [go to URL <http://www.agu.org/meetings/ja07/waissm07.html> and search on "ackerman"]].
- Tiersch T.R., Yang H., Jenkins J.A., and Dong Q., 2007, Sperm cryopreservation in fish and shellfish, *in* Roldan, E.R.S., and Gomendio, M., eds., *Spermatology* (Society of Reproduction and Fertility supplement 65): Nottingham, U.K., Nottingham University Press, p. 493-508 [URL <http://www.nup.com/Catalogue/ProductContents.aspx?ProductID=128>].
- Tyler, D., Zawada, D.G., Nayegandi, A., Brock, J.C., Crane, M.P., Yates, K.K., and Smith, K.E.L., 2007, Topobathymetric data for Tampa Bay, Florida: U.S. Geological Survey Open-File Report 2007-1051 [URL <http://pubs.usgs.gov/of/2007/1051/>].
- USGS National Wetlands Research Center and Bill Wilen, 2007, Landscape change processes on the deltaic Gulf Coast, *in* Council on Environmental Quality (U.S.), *Conserving America's wetlands 2007; three years of progress implementing the President's goal*: Washington, D.C., Executive Office of the President, Council on Environmental Quality, p. 10 [URL <http://www.whitehouse.gov/ceq/wetlands/2007/index.html>].
- ## Publications Submitted for Director's Approval
- Cochran, S.A., Benthic habitat maps of the south Moloka'i coral reef, chap. 9 of Field, M.E., Cochran, S.A., Storlazzi, C.D., and Logan, J.B., eds., *Atlas of a fringing coral reef, Moloka'i, Hawai'i—natural processes and new threats to the longest fringing reef in the Hawaiian chain*: U.S. Geological Survey Scientific Investigations Report.
- Draut, A.E., Bothner, M.H., Reynolds, R.L., Field, M.E., Cochran, S.A., Logan, J.B., Storlazzi, C.D., and Berg, C.J., Supply and dispersal of seasonal flood deposits in Hanalei Bay, Kaua'i, HI, USA; implications for coral-reef ecosystems [abs.]: American Geophysical Union Ocean Sciences Meeting, Orlando, Fla., March 2-7, 2008.
- Ellis, M., Evan, R.L., Hutchinson, D.R., Hart, P.E., Gardner, J., and Hagen, R., Electromagnetic surveying of seafloor mounds in the Gulf of Mexico: Marine and Petroleum Geology, special issue on U.S. Department of Energy/Joint Industry Project (DOE/JIP) science results.
- Fisher, M.A., Scholl, D.W., Geist, E.L., Sliter, Ray, Wong, F.L., Reiss, Carol, and Mann, D.M., Forearc structure near the epicenter of the April 1, 2007, megathrust earthquake (M_w 8.1) and tsunami in the Solomon Islands arc [abs.]: American Geophysical Union Fall Meeting, San Francisco, Calif., December 10-14, 2007.
- Fregoso, Theresa, Foxgrover, Amy, Jaffe, Bruce, and Tomlin, Vanessa, Understanding sediment deposition, erosion, and bathymetric change in central San Francisco Bay [abs.]: Biennial State of the San Francisco Estuary Conference, 8th, Oakland, Calif., October 16-18, 2007.
- Hart, P.E., High-resolution marine seismic reflection profiling; systems and capabilities [abs.]: Acoustical Society of America Annual Meeting, New Orleans, La., November 27-December 1, 2007.
- Jaffe, Bruce, and Foxgrover, Amy, Will restoration of salt ponds in south San Francisco Bay cause erosion of intertidal flats? [abs.]: Biennial State of the San Francisco Estuary Conference, 8th, Oakland, Calif., October 16-18, 2007.
- McGann, Mary, Benthic foraminifera identify source area of earthquake- and storm-induced turbidite events, Monterey Submarine Canyon, California [abs.]: Geological Society of America Annual Meeting, Denver, Colo., October 28-31, 2007.
- McGann, Mary, Distribution of modern foraminifera in San Francisco Bay estuary (1961-1981); baseline before the *Trochammina hadai* Uchio introduction [abs.]: Biennial State of the San Francisco Estuary Conference, 8th, Oakland, Calif., October 16-18, 2007.
- Normark, W.R., McGann, M.L., Paull, C.K., Ussler, William, III, and Keaten, Rendy, Tsunamigenic potential of sediment accumulations at submarine canyon mouths, Santa Monica Basin, offshore southern California [abs.]: Geological Society of America Annual Meeting, Denver, Colo., October 28-31, 2007.
- Paul, V.J., Ritson-Williams, R., Walters, L.J., Kuffner, I.B., and Becerro, M.A., Comparisons of chemically mediated marine plant-herbivore interactions on Florida, Caribbean, and Pacific reefs and consequences for reef communities: Japan-U.S. Seminar on Marine Natural Products, July 2007, Park City, Utah.
- Paull, C.K., Normark, W.R., Ussler, William, III, Caress, D.W., and Keaten, Rendy, Association among active seafloor deformation, mound formation, and gas hydrate growth and accumulation within the seafloor of the Santa Monica Basin, offshore California: Marine Geology.
- Paull, C.K., Normark, W.R., Ussler, William, III, Caress, D.W., and Keaten, Rendy, Morphological expression of gas hydrate growth and accumulation within the seafloor of the Santa Monica Basin, offshore California [abs.]: International Conference on Gas Hydrates, 6th, Vancouver, B.C., Canada, July 6-10, 2008.
- Pederson, Jean, and Collins, B.D., Engineer profile, *in* Educational handout for middle school students: WGBH, Boston Public Radio and Television.
- Piniak, G.A., and Brown, E.K., Seasonal variability of in situ chlorophyll fluorescence of back reef corals in Ofu, American Samoa: Marine Biology.
- Wilson, A.M., and Ruppel, Carolyn, Salt tectonics and shallow subseafloor fluid convection; models of coupled fluid-heat-salt transport: Geofluids.